Cisco BTS 10200 Softswitch EPOM Getting Started Guide

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CHAPTER 1

Installing, Starting, and Logging into EPOM

Learning About EPOM

Extensible Provisioning and Operations Manager (EPOM) is a web-based application for real-time provisioning of the BTS. It allows EPOM users to easily Show, Add, Edit, Delete, and view the status of BTS components. EPOM provisioning generally matches that done using CLI or MAC. EPOM tasks are done via a web-browser. Common multi-step procedures are simplified by being grouped into tasks completed by wizards.

The EPOM database maintains administrative data (EPOM users, groups, and domains) and BTS device inventory. EPOM users view device-level information (like subscribers, features, and media gateway communications) as it is retrieved from EMS servers in real time; it is not stored in the EPOM database.

Table 1-1 EPOM Requirements

Device/Software	Requirement
EPOM Server supporting 5 simultaneous remote client and 5 BTS servers	• Sun workstation (440 MHz or more) • 1 GB RAM • 2 GB disk space • Sun Solaris 8/10
EPOM Server supporting 20 simultaneous remote client and 10 BTS servers	• Sun Ultra-60 workstation (440 MHz or faster, dual processor) • 2 GB RAM • 4 GB disk space • Sun Solaris 8/10
Port defaults	• MySQL—3310 • Tomcat non-secure—8080 • Tomcat secure—443 • Tomcat shutdown—8041
EPOM Client Windows	• Microsoft Internet Explorer, Version 5.5 and 6 only. • Netscape 6.2 or higher
EPOM Client Solaris	Mozilla 1.1 or higher

Device/Software	Requirement
EPOM Server supporting 5 simultaneous remote client and 5 BTS servers	• Sun workstation (440 MHz or more) • 1 GB RAM • 2 GB disk space • Sun Solaris 8/10
Cisco BTS 4.5.0 with Secure or Non Secure OpenOrb CORBA	EPOM 4.5
Cisco BTS 5.0 with Secure or Non Secure OpenOrb CORBA	EPOM 5.0
External RADIUS Server	Any platform capable of running Radius IETF (International Engineering Task Force) Radius software must implement RADIUS IETF protocol.

Installing EPOM

During installation EPOM does the following:

- creates and initializes a database that stores
  - EPOM user IDs
  - login passwords
  - group information
  - device inventories
- creates the following two directories:
  - Application directory—**`/opt/CSCOepom`**. Do not create or modify any of the files in this directory.
  - Data directory—**`var/opt/CSCOepom`** . Log files and live data are here.

If it detects an existing database, the installation script does not reinitialize the database. Cisco does not recommend reinitializing the database.

Before installing EPOM complete the tasks in this checklist.

Tasks	
☐	Ensure the BTS package is installed on the EMS primary and secondary servers.
☐	Ensure CORBA is running on the EMS primary and secondary servers.
☐	If you are using a RADIUS server, ensure it is running and configured with the following: • logins • shared secret keys • EPOM server IP address /hostname

After completing the pre-install checklist, install EPOM:

Step 1 Change user to superuser:

```
su - root
```

Step 2 Download EPOM image from:

http://www.cisco.com/cgi-bin/tablebuild.pl/epom50

Step 3 Extract tarfile:

```
tar -xvf epom-n_n_n_x-nnnnnnnn-n.tar
```

Step 4 Change working directory:

```
cd epom-n_n_n_x-nnnnnnnn-n
```

Step 5 Run Setup script:

```
./setup
```

Step 6 Remove installation image:

```
cd epom-n_n_n_x-nnnnnnnn-n
rm -f epom-n_n_n_x-nnnnnnnn-tar
rm -rf epom-n_n_n_x-nnnnnnnn-n
```

Configuring RADIUS Server for EPOM Authentication

Using an external RADIUS IETF Server is optional and based on the security needs of your company. If you are using a RADIUS server, ensure it is running and configured with the following:

- logins
- shared secret keys
- EPOM server IP address /hostname

To configure the RADIUS server, use the following parameters:

- radius.enable—set to **yes**
- radius.ip—set to IP address of RADIUS server
- radius.shared.secret—shared secret key for the IP address/hostname of the EPOM server. Shared secrets are the MD5 encryption algorithm key used by the RADIUS protocol. They are required in all RADIUS protocol communications. The shared secret value is known on each side of the communication but is never sent across the network.
- radius.authenticationPort—accept default ports unless you have modified them on the RADIUS server
- accountingPort—accept default ports unless you have modified them on the RADIUS server

Step 1 Log into the EPOM web server.

Step 2 Change user to superuser:

```
su - root
```

Step 3 Go to the main properties file:

```
cd /opt/CSCOepom/tomcat/webapps/ROOT/WEB-INF/classes/com/cisco/opus/
props
```

Step 4 Change the parameters as needed:

```
radius.enable=no
radius.ip=10.76.62.105
radius.sharedsecret=1001
radius.authenticationPort=1812
radius.accountingPort=1813
```

Starting EPOM

Before starting EPOM complete the tasks in this checklist.

Tasks	
☐	Ensure you have the following information: • Tomcat non-secure port number • Tomcat secure port number
☐	Select defaults displayed for a secure connection: • If you are using the default port 443, enter: **https://EPOMhostname** or **https://IPaddress** • If you are using any other port, enter: **https://EPOMhostname:port number** or **https://IPaddress** Where EPOMhostname/IPaddress—host machine where EPOM is installed or server IP address port number
☐	Select defaults displayed for an insecure connection: • If you are using port 80, enter: **http://EPOMhostname** or **https://IPaddress** • If you are using any other port (default installed port is 8080), enter: **http://EPOMhostname:port number** or **https://IPaddress:port number** Where EPOMhostname/IPaddress—host machine where EPOM is installed or server IP address port number

After completing the pre-start checklist, start EPOM:

Step 1 From the EPOM web server:

`/opt/CSCOepom/bin/epom start`

The following appears:

```
% /opt/CSCOepom/bin/epom start
------------------------------------------------
Starting EPOM
------------------------------------------------
```

Step 2 Complete the InstallShield Wizard.

The following appears:

```
Starting MySQL
MySQL server is already started
Starting Tomcat
Tomcat has started
------------------------------------------------
EPOM Started
------------------------------------------------
```

Logging Into EPOM

Step 1 Launch a web browser.

Step 2 Access EPOM.

Step 3 Log in with the default admin account:

User Name: **`admin`**

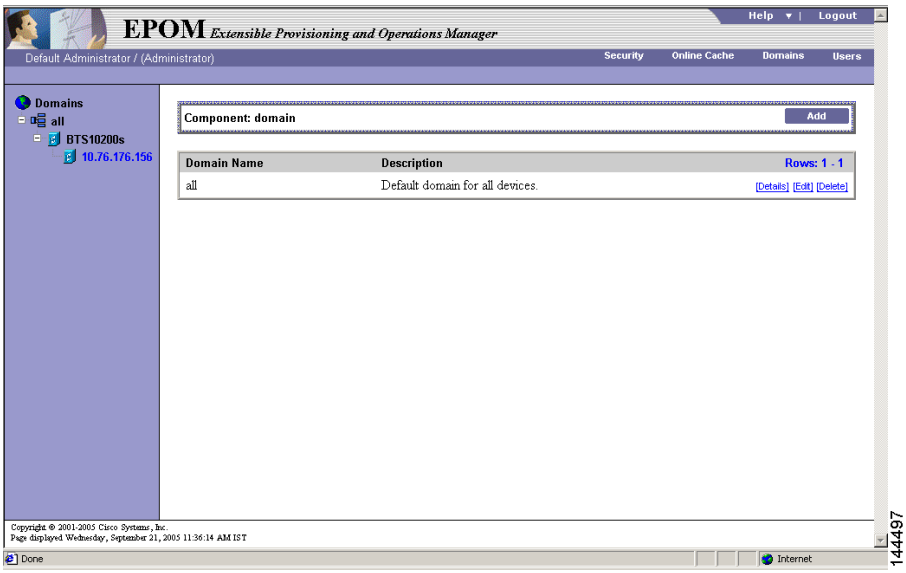
Password: **`admin`**

Step 4 Click **Login**.

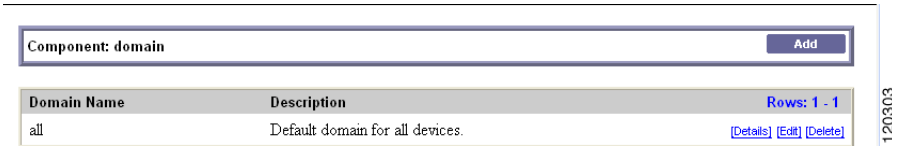
CHAPTER 2

Learning the EPOM GUI

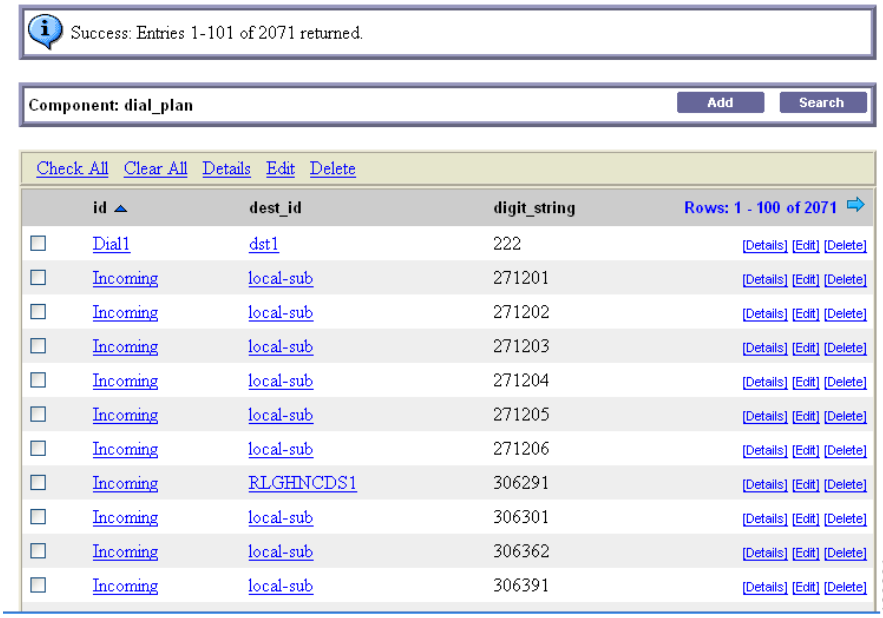
After logging in, the following appears.:



Element	Description
title	Identifies current window  120292
banner	Displays application name and **Help** and **Logout** buttons  120293
Main menu	Displays current EPOM user name, user type (Administrator or User). Includes buttons to switch between domain management, EPOM user administration, Online Cache Management, and Security Management. 

Element	Description
Submenu	Displays currently selected component and buttons for major operations on that component.  Click link to selected EMS server for index.
Navigation pane	Displays a tree view. 
Navigation pane, icons	When you select an EMS server and click **Config**, icons identify the main objects and default action that occurs when you click the object.
	Main component, expandable to view subcomponents.
	Shows component or list of components of that type, and access other operations like adding or searching for components.
	Click to search for components of this type.
	Click to check or change status.
	Click to diagnose the component.
Content area	Displays information about the object in the navigation pane.  Includes a title describing the object and command buttons for actions that apply to it. Management windows display a list of managed objects and buttons like **Edit** or **Delete**.

Element	Description
Managed object windows	These windows include standard elements and navigation features.



- Sort by column headers.
- View defined objects of the selected type.
- Perform operations on a selected object.
- Move between windows using links.

Parameter fields

Click to select from a list of parameters values:

Click  to open Selection Helper window. Make your choice, click **OK**.

Add subelement fields

Drill down toa form to add a subelement. In this example for the component, ISDN B-channel, the trunk group ID field is empty:

Click  to open a form to define the sub-element, click **OK** to save the changes or **Apply** to save the changes and continue working in the sub-element form.

For field help, point to  .

Performing Standard Operations

In the managed object window, you can execute any operation supported for that object type. The operation appears as an underlined blue link.

Note Each operation maps to a CLI command. The same rules that apply to CLI commands apply to these operations.

These operations are available:

- **Add**—Add a component.
- **Edit**—Edit a component.
- **Details**—Show all information on a component.
- **Delete**—Remove a component from a configuration. You cannot delete a component if other components depend on it. For example, you cannot delete a subscriber profile until you have deleted all the subscribers that are associated with it.
- **Status**—Check the status of a component.
- **Control**—Take a component in or out of service.
- **Diag**—Issue a diagnostic command to a component.
- **Equip**—Equip components to put them in service.
- **Unequip**—Unequip a component prior to deleting.
- **Reset**—Reset defined circuit identification codes (CICs).
- **Search**—Search for components meeting specified criteria. For example, in the subscriber window, to find a list of subscribers using a particular media gateway, in **mgw_id** enter the gateway ID and click **Search**. A list of matching subscribers appears.
- **Audit**— Examine data tables entries.
- **Sync**— Sync data between data tables and shared memory segments

Caution Sync is a restricted command and is intended for repairing data only. Improper use may corrupt database and disrupt call processing. Use with caution.

Using EPOM's Main Windows

EPOM's three main windows are:

- Domain Management
- User Management
- Online Cache Management

Window—Domains	Access With	Use To…
Domain Management	Domains button	• Manage domains and devices • Access domain-level tasks

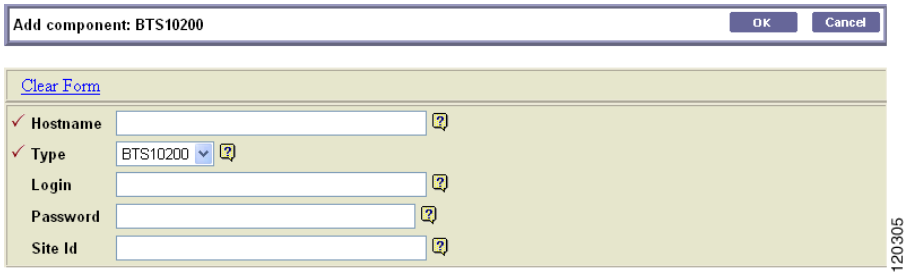
Domain Details	**Details** or click the domain in the Domain tree	• View inventory devices in the domain and which EPOM user groups have access
Modify Domain	**Edit** from Domain Details	• Add BTS devices, add groups with access to the domain
BTS Component Status	With a EMS server selected in the Domain tree window, click **Config**	• View, modify, check or change BTS status • Schedule provisioning tasks • Access Provisioning Wizards
BTS Configuration Wizard	In Configuration tree, click **Provisioning Flow**, click task	• Perform provisioning operations with prompts for each step
BTS Component Reports	Select an EMS in the Domain tree window, click **Reports**	• Select and view Performance or Billing Reports
Window—Users	**Use To…**	
User Administration	**Administrators**—Add, modify, or delete EPOM users, including assigning users to groups. **Users**—View your settings and change your first name, last name, password, or email.	
Group Administration	**Administrators**—Add or delete groups (listed under Groups in the Edit User window so you can assign or unassign EPOM users).	
Window—Online Cache	**Use To…**	
Online Cache Management	**Administrators**—Renew, Delete and view CORBA connections between EPOM and BTS inventories. **Users**—View CORBA connections between EPOM and BTS inventories.	
Security Management	**Administrators** • Add new EPOM users in EMS servers • Add new BTS inventories in EPOM • Add, edit, and delete EPOM users. • Create new groups and include EPOM users.	

Using EPOM Forms

Use EPOM forms to Add, View, and Edit information on:

- components
- domains
- EPOM users
- groups
- reports
- devices

The Add component form is an example:



In a form, you can do the following:

- Fill in or select field values. Required fields have a red checkmark.
- Click **Clear Form** to delete existing information.
- Click **OK** to save the current field values.
- Click **Cancel** to discard any changes.

In Add forms, use **Apply** to add multiple components with the same properties.

CHAPTER 3

Managing EPOM and BTS Users

Managing Domains, Groups, and Users

Assign read, write, or read-only access for EPOM users using the following administrative tools:

- group—organize users based on the domains to which you want them to have accesss
- domain—organize networks into logical groups accessible to specific user groups
- user

Managing Groups

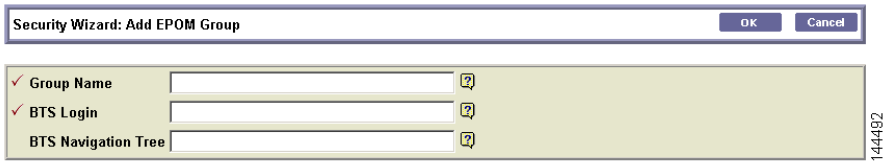
Adding Groups

Whan you create a group, it is automatically assigned to a default domain. Reassign the group to another domain after:

1. adding the group
2. adding the domain

Step 1 Click **Add**.

The Add user window opens.



Step 2 Define the :

- **Group Name**—Enter the name of the group. The group name must not exceed thirty two characters.
- **BTS Login**—Enter the BTS Login ID.
- **BTS Navigation Tree**—Enter the BTS customised navigation tree . The navigation tree can contain two hundred and fifty five characters.

Step 3 Click **OK**.

The group is added, and you return to the User Administration window where the new group is listed.

Click **Cancel** if you do not want to add the EPOM group.

Changing Group Permissions

Step 1 Next to *XYZ Domain* **Groups**, click **Edit**.
The Group Edit window opens listing all groups and their current access.

Step 2 Select access type, **Read/Write** or **Read Only**.

Step 3 Click **OK**.

Deleting Groups

First delete the domain associated with the group. You cannot delete the default group admin and the default userid admin.

Step 1 Click **Users** if you are not already in the User Administration window.

Step 2 In the navigation pane, click **Groups**.

The Group Administration window opens listing existing groups.

Step 3 In the row for the group that you want to delete, click **Delete**.

The Delete Group window opens.

Step 4 Click **OK**.

Managing Domains

Adding Domains

Add a domain to create a network group accessible to specific user groups. A domain includes an EMS server and groups with access to the domain.

Whan you create a group, it is automatically assigned to a default domain. Reassign the group to another domain after:

1. adding the group

2. adding the domain

Step 1 Click **Domains**.

Step 2 Click **Add**.

The Add Domain window opens.

Step 3 Define the domain:

a. **Domain Name**.

b. (Optional) **Description**

c. Click **OK**.

Adding EMS Servers to a Domain

Step 1 Click **Domains**.

Step 2 Click **Edit**.

The Modify Domain window opens.

Step 3 Next to **No Inventory Found**, click **Edit**.
The Inventory Edit window opens listing existing EMS servers.

Step 4 Select the server to add.

Step 5 Click **OK.**

Managing Users

Adding Users

Before adding a users, ensure its group already exists.

EPOM's Security Wizard allows admin users to:

- create both BTS and EPOM users
- create users in multiple EMS servers with appropriate security levels in a single operation
- add EPOM user information
- add group membership for an inventory or multiple inventories

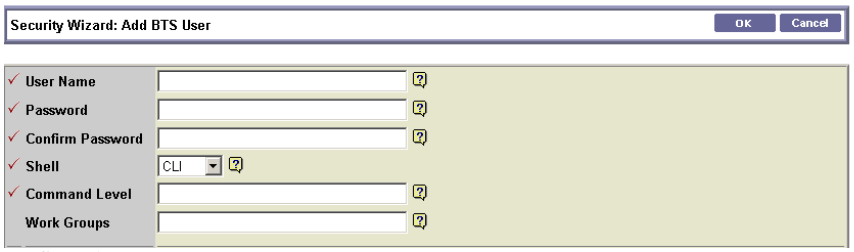
Step 1 Select BTS or EPOM, depending on user type.

Step 2 Click **Next**.

The list of current users appears.

Step 3 Click **Add**.

The Add user window opens.



Step 4 Define the user:

- **Username**—name the user will use to log in to EPOM

- **Password**—initial password for EPOM access, the user can change this later
- **Confirm Password**
- **Shell**—command session
- **Command Level**—command levels based on the security levels
- **Work Groups**—names of the workgroups
- **Inventory**—select inventory and move to Selected; to deselect, move it back to Available

Step 5 Click **OK**.

Step 6 Click **Finish** .

Editing and Deleting EPOM Users

You can modify or delete EPOM user information. If you are not a member of the Administrator group, you can change your password, first name, last name and email, but not your login ID or group association.

If you are a member of the admin group, you can:

- change user information, including group membership
- delete users

Step 1 Click **Users** if you are not already in the User Administration window.

Step 2 The list of current users appears.

Step 3 In the row for the user whom you want to change, do one of the following:

- To modify user information:

a. Click **Edit**.

The Edit User window opens.

b. Make the changes and click **Edit** to save them.

c. To delete the user, click **Delete**.

The Delete User window opens.

d. Click **Delete**.

You return to the User Administration window, showing the list of users.

Changing Your User Information

If you are not a member of the admin group:

- you can change your password, name and email
- you cannot change your userid or group association

Step 1 Click **Users**.

The User Administration window opens.

Step 2 Select your row.

Step 3 Click **Edit**.

The Edit User window opens.

Step 4 Make changes.

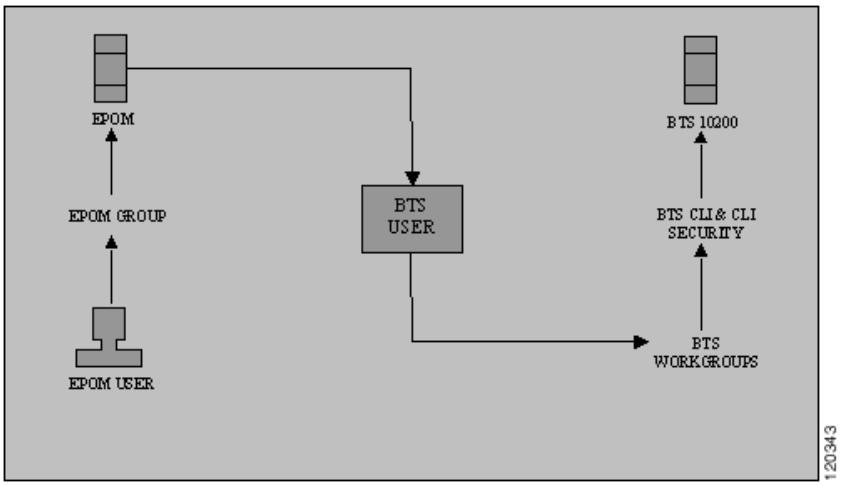
Step 5 Click **Edit**.

Managing User Security

Restricting User Access By Group 1

EPOM provisions restricted BTS command access not on a per-user basis, but on a per-group basis. Each group has a single BTS login (therefore a single BTS device, unless multiple BTS devices have similar logins and restricted access applied to them).

However, a single EPOM user can be associated with multiple EPOM Groups to provision restricted access across various BTS devices across the network.



Restrict a user's access to that of the BTS login name and password of their EPOM group. When a user logs in to EPOM, their group is examined for a BTS login:

- If EPOM finds a group, it queries the BTS user table for the user's security level and work groups.
- If no BTS login name is assigned to the EPOM group, security defaults to the user login and password for the device.

Each time a user enters a command, EPOM determines if the user has permission. If the user does not meet or exceed permission requirements, a "permission denied" message appears.

Note If you modify BTS login security level or groups, EPOM users must log out and log in to EPOM for changes to take effect.

Note If you change the security level or groups for BTS commands, restart EPOM for changes to take effect.

Step 1 Create BTS users.

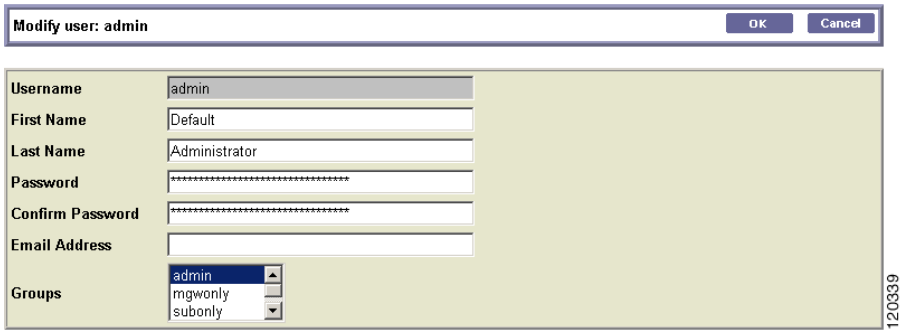
Step 2 Create EPOM user groups.

Step 3 On the EPOM server:

a. create users

b. assign users to user groups

Step 4 Select **Users** > *user name* > **Edit**.

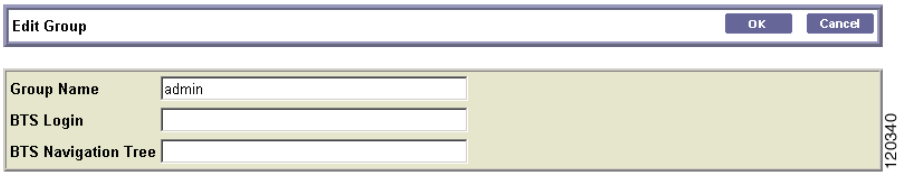


Step 5 Enter a password to access EPOM.

Step 6 Choose **Users** > **Groups** > **Edit**.

Step 7 Select a group.

Step 8 Click **Edit**.



Step 9 Assign the EPOM user group to a BTS user by entering the user's BTS Login and (optional) BTS Navigation Tree.

If a EPOM user group is not assigned to a BTS user, all users in that group have a security level of 10 (unrestricted).

Step 10 To verify the assigned BTS login, choose **Users** > **Groups** > *group name* > **Edit.**

Restricting User Access By Group 2

Defining Group Settings

This section describes how to analyse the portions of defaulttree.xml.

<tree name="default">

The above line defines the tree name, when customizing the tree, say in Group settings you gave the navigation tree name as customizedtree.

In this if $EPOM_INSTALL_DIR is the EPOM installation directory then you would create a new xml file named customizedtree.xml under the directory $EPOM_INSTALL_DIR/tomcat/webapps/ROOT/xml/bts/navigation.

Change the above line to **<tree name="customizedtree">**.

```
<baseurl name="bts">
       <urlprefix><![CDATA[/bts/btscomp.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="btssearch">
          <urlprefix><![CDATA[/bts/btscompsearch.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="btsstatus">
          <urlprefix><![CDATA[/bts/btscompstatus.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="btsdiag">
          <urlprefix><![CDATA[/bts/btscompdiag.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="btsreset">
          <urlprefix><![CDATA[/bts/btscompreset.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="btswizard">
          <urlprefix><![CDATA[/bts/btswizard.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>
```

The above lines form the backbone of ascertaining, the actions to be invoked for various BTS CLI nouns. The following is the summary of associations they make:

1. bts keyword is associated with the btscomp.jsp page.
2. btssearch keyword is associated with the btsscompearch.jsp page.
3. btsstatus keyword is associated with the btscompstatusjsp page.
4. btsdiag keyword is associated with the btscompdiag.jsp page.
5. btsdiag keyword is associated with the btscompdiag.jsp page.
6. btsreset keyword is associated with the btscompreset.jsp page.
7. btswizard keyword is associated with the btscompwizard.jsp page.

These associations are further extended in the next section and finally used on a per BTS CLI noun basis.

```
<baseurlverbmap base="bts" verb="show"/>
```

```
<baseurlverbmap base="btssearch" verb="show"/>
<baseurlverbmap base="btsstatus" verb="status"/>
<baseurlverbmap base="btsdiag" verb="diag"/>
<baseurlverbmap base="btsreset" verb="reset"/>
```

The above lines further implicate the default BTS CLI verbs to be associated to the keywords defined in above section.

Finally we proceed further with the actual BTS CLI noun formations in the navigation tree.

```
<branch reskey="bts.head.ain">
    <node reskey="bts.ani_wb_list">
        <url base="bts">ani_wb_list</url>
    </node>
</branch >

<branch reskey="bts.head.isdn">
    <node reskey="bts.isdn_bchan" image="btssearch">>
        <url base="btssearch">isdn_bchan</url>
    </node>
</branch >
```

The above defines two different nouns and verb actions to be invoked from them.

- The first <branch….ain>, statement defines that the ain, would be displayed as the heading under which all other nouns would appear.

  In this example ani_wb_list would appear after node ain is expanded. The <url base="bts"> signifies that show verb would be used for that noun and it would be invoked in btscomp.jsp.

- The second <branch….isdn>, statement defines that the isdn, would be displayed as the heading under which all other nouns would appear.

  In this example isdn_bchan would appear after node isdn is expanded. The <url base="btssearch"> signifies that show verb would be used for that noun and it would be invoked in btscompsearch.jsp. Where before invoking show command, parameters would be accepted to build where clauses while searching the noun.

This is to provide access to just subscriber show, change.

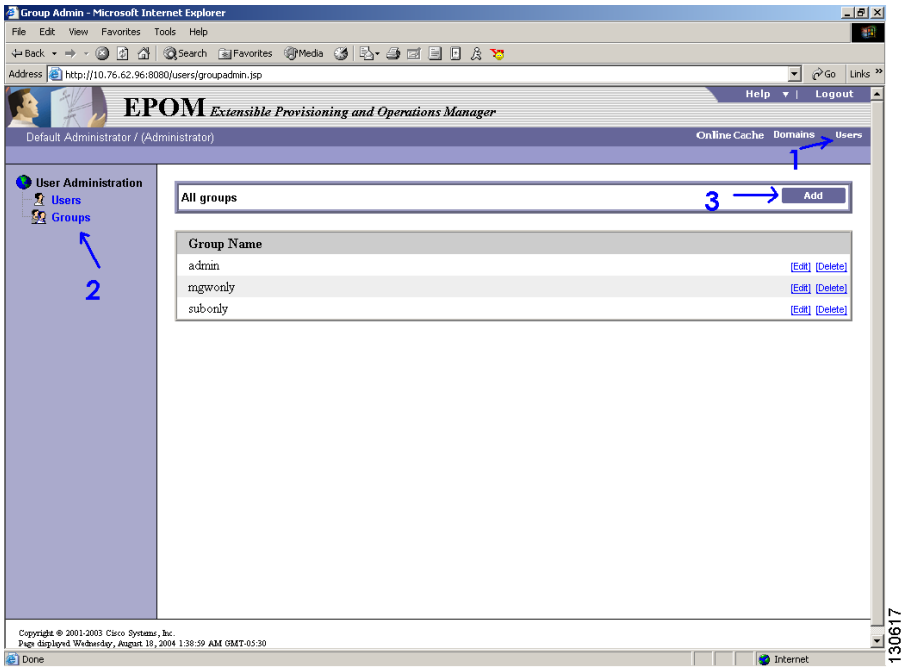
Step 1 Create a new BTS user restrictedBTSUser, with just show privileges on subscriber noun. Associate it properly with BTS workgroups.

Step 2 Add a group in EPOM:

a. Click on "Users" (#1) in the primary navigation

b. Click on Groups in the left side navigation tree, (#2)

c. Click on the "Add" button, (#3)



Step 3 Use parameters as

a. Groupname: restrictedGroup

This is the EPOM group that you are creating.

b. BTS Login restrictedBTSUser

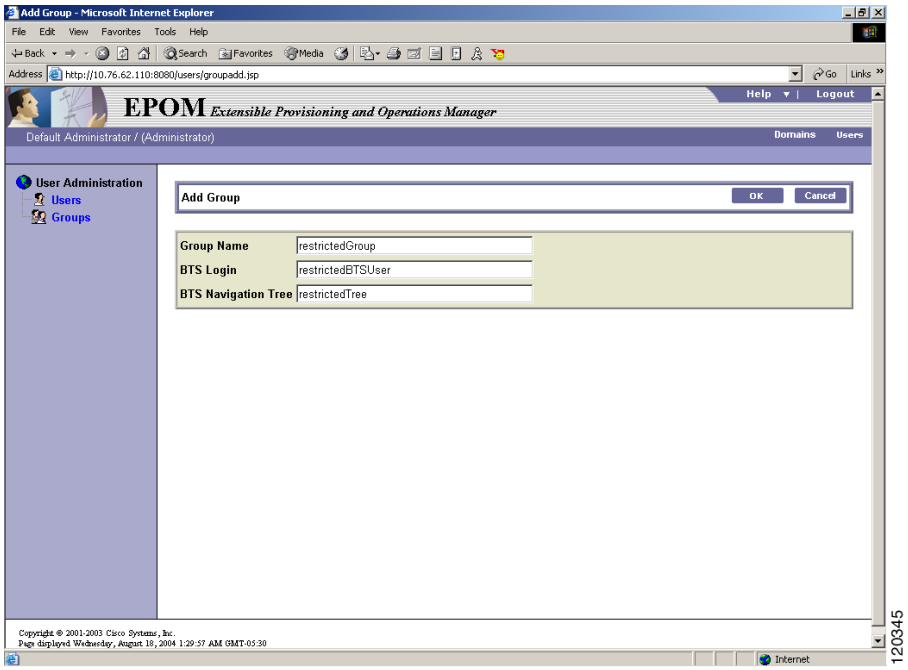
This BTS id was created with restricted access on the BTS server and proper BTS workgroup, and command associations were made on BTS (see BTS CLI Reference for more Details).

c. BTS Navigation tree:restrictedTree

This points to the XML file that you put on the EPOM server, customized using the Navigation Trees section in this document. Change <tree name="restrictedTree"> in the file $EPOM_INSTALL_DIR/tomcat/webapps/ROOT/xml/bts/navigation/restrictedTree.xml. Review the example restrictedTree.xml file at end of the document

Specifying the BTS Login ID indicates that EPOM users of group restrictedGroup can only issue BTS commands with the authority and privilege of BTS user restrictedBTSUser . By creating the restrictedBTSUser user in the BTS CLI file, you are limiting the commands that the users can perform.

The BTS Navigation tree identifies an XML file that will be used to list the users of the restricted Group from the BTS configuration items for them to select.



Step 4 Create Users with a Group of "restrictedGroup"

Step 5 Need to associate the All domain with the "restrictedGroup"

a. Click on **Domains**

b. Click on the **All domain** in the navigation tree.

c. Click on **Edit**

d. Scroll down to All Groups and press **Edit**

For the RestrictedGroup specify **READWRITE**

e. Press **OK**

Step 6 Logout, log back in as one of the users that you created in Step 5.

They should only have access to see, subscribe, show, and change.

restrictedTree.xml

```
<tree name="restrictedTree">


<baseurl name="bts">
    <urlprefix><![CDATA[/bts/btscomp.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="btssearch">
    <urlprefix><![CDATA[/bts/btscompsearch.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>
```

```
<baseurl name="btsstatus">
    <urlprefix><![CDATA[/bts/btscompstatus.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="btsdiag">
    <urlprefix><![CDATA[/bts/btscompdiag.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="btsreset">
    <urlprefix><![CDATA[/bts/btscompreset.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="btswizard">
    <urlprefix><![CDATA[/bts/btswizard.jsp?_inv=[_inv]&_noun=]]></urlprefix>
</baseurl>


<baseurl name="images">
    <urlprefix>../images/treemenuimage</urlprefix>
</baseurl>


<baseurlverbmap base="bts" verb="show"/>
<baseurlverbmap base="btssearch" verb="show"/>
<baseurlverbmap base="btsstatus" verb="status"/>
<baseurlverbmap base="btsdiag" verb="diag"/>
<baseurlverbmap base="btsreset" verb="reset"/>


<imagepath>
    <url base="images"/>
</imagepath>


<image name="BTS10200">
    <url base="images">16x16_BTS_10200_Softswitch_Blue.gif</url>
</image>

<image name="tablegrp">
    <url base="images">table16_window.gif</url>
</image>
<image name="bts">
    <url base="images">table16.gif</url>
</image>
<image name="btssearch">
    <url base="images">table16_basicquery.gif</url>
</image>
<image name="btsstatus">
    <url base="images">table16_show.gif</url>
</image>
<image name="btsdiag">
    <url base="images">table16_diag.gif</url>
</image>


<image>
    <url base="images">menu_folder_open.gif</url>
</image>


<image>
    <url base="images">menu_folder_closed.gif</url>
</image>
```

```
<image>
    <url base="images">menu_corner.gif</url>
</image>

<image>
    <url base="images">menu_corner_plus.gif</url>
</image>

<image>
    <url base="images">menu_corner_minus.gif</url>
</image>

<image>
    <url base="images">menu_bar.gif</url>
</image>

<cssclassmap type="branch" class="parent_node"/>
<cssclassmap type="node" class="child_node"/>

<imagemap type="branch" image="tablegrp"/>
<imagemap type="node" image="bts"/>

<root name="[_hostname]" class="parent_node" image="BTS10200">

<url base="btsstatus"><![CDATA[system&_cmd=do_status]]></url>

<branch name="Restricted Commands">

<node reskey="bts.subscriber" image="btssearch">
    <url base="btssearch">subscriber</url>
</node>

</branch>
</root>
</tree>
```

Restricting User Access By EPOM GUI Visibility

To prevent a user from seeing (therefore modifying or deleting) BTS objects on the EPOM GUI, create custom navigation trees. These trees are defined by an .xml file that follows simple syntax rules.

The defaulttree.xml file is in: /opt/CSCOepom/tomcat/webapps/ROOT/xml/bts/navigation. Use defaulttree.xml as a template for defining new trees.

Step 1 Create your customized navigation tree as an .xml file.

Step 2 Place the .xml file in the /opt/CSCOepom/tomcat/webapps/ROOT/xml/bts/navigation directory.

Step 3 Choose **Users** > **Groups** > *group name* > **Edit**.

The Edit Group window appears.

Step 4 In the BTS Navigation Tree field, enter the name of the file you created.

Step 5 Click **OK**.

Viewing User History

Because all commands are issued from EPOM, each command appears in the BTS audit logs as being performed by a single BTS user.

The audit.log and trace.log files are on the EPOM server in /var/opt/CSCOepom/logs:

- audit.log--shows you which user issued which command
- audit.log--shows you access denials

CHAPTER 4

Configuring BTS Components

Bulk Provisioning

To use information on one BTS server to configure another BTS server:

1. use the bulk_export command to generate a CLI file from the first BTS server
2. use the bulk_import command to load that generated CLI file on the other BTS server; it uses SSL to transfer the file from the EPOM server to the BTS server

bts_export looks like the following:

```
root@cyber229:opt 21> /opt/CSCOepom/bin/bts_export

NAME

   bts_export - BTS Config Export

SYNOPSIS

   bts_export -h hostname -v BTSver of hostname -o outfile [-l login -p password

]

DESCRIPTION

   Export a BTS Configuration.

OPTIONS

   -h   Hostname

   -v   BTSversion of hostname (3.5,4.1,4.2,4.4.0,4.4.1. 4.5.0)

   -o   Output file

   -l   Login

   -p   Password

   -s   Site ID

EXAMPLES

   1. bts_export -h bts_host -v host_bts_ver -o config.cli

   2. bts_export -h bts_host -v host_bts_ver -l login -p passwd -s       siteid -o con

      fig.cli
```

bts_import looks like the following:

```
root@cyber229:opt 22> /opt/CSCOepom/bin/bts_import
```

```
NAME
   bts_import - BTS Config Import
SYNOPSIS
   bts_import -h hostname -u username  -f inputfile
DESCRIPTION
   Import a BTS Configuration.
OPTIONS
   -h   Hostname
   -f   Input file
   -u   User name
EXAMPLES
   1. bts_import -h bts_host -u usrname -f config.cli
```

Bulk Data Export

Using the export.xml (input) file in /opt/CSCOepom/bin/, you can export all data in a BTS release from the EPOM to the BTS.

Each noun has an entry in the export.xml file. For example:

```
<itemlist>
   <item noun="call_agent"/>
   <item noun="domain2route"/>
   ...
</itemlist>
```

When you enter bts_export the EPOM sequentially selects each noun and verb from export.xml. (Verbs distinguish between add or change commands). For each noun and verb the following occurs:

1. The bts_export module picks a noun or verb from export.xml.
2. The bts_export module generates the show command.
3. EPOM sends the request as “show <noun>” to the BTS.
4. The BTS sends a response to EPOM containing all of that noun's or verb’s attributes in the BTS.
5. EPOM parses the response.
6. EPOM generates an add or change command, based on the noun's attributes and value. Some nouns do not support the add command; they use change instead.
7. EPOM writes these add/change commands to the text output file you specify in /opt/CSCOepom/bin/.

Exporting Data from EPOM to BTS

Step 1 Go to /opt/CSCOepom/bin/.

Step 2 Enter `bts_export -h hostname -v BTSver of hostname -o outfile [-l login -p password`.

The text output file you specify containing all data in a BTS release appears in /opt/CSCOepom/bin/

Connecting EMS Servers

Before Adding EMS Servers

Before adding an EMS server complete the tasks in this checklist.

Tasks	
☐	Ensure you have the hostname and IP address of the EMS server.
☐	Ensure you have the login and password of the EMS server.
☐	Ensure you have the Site ID of the EMS server: 1. Log in to the EMS server as the root user. 2. Enter: **`grep SITEID /etc/opticall.cfg`** **`SITEID=rtpvtc2`**

Adding EMS Servers

Add an EMS server to the "all" domain and set up the initial configuration.

Step 1 Start EPOM.

EPOM opens to the Domain Management window.

Step 2 In the Domain pane, in the **all** domain row, click **Edit**.

The Modify component, Domain window opens.

Tip Because you are viewing the "all" domain, the Inventory and Groups items are also preceded by "all" (all Inventory and all Groups).

Step 3 In the all Inventory pane, click **Add**.

The Add component window opens.

Step 4 Enter:

- Hostname: hostname or IP address of EMS server
- Type: **BTS 10200**
- Login: EMS server login
- Password: EMS server password

- Site ID: site ID for EMS server

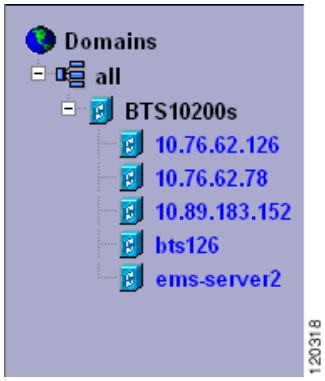
Step 5 Click **OK**.

Configuring EMS Servers

Step 1 Expand the domain tree:

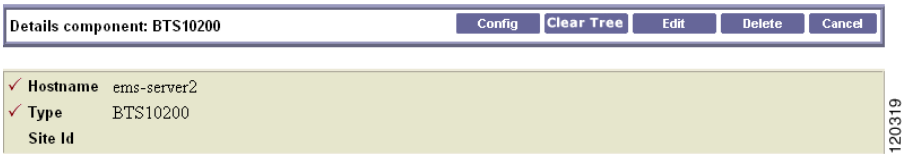
a. Click **all**.

b. Click **BTS 10200s**.



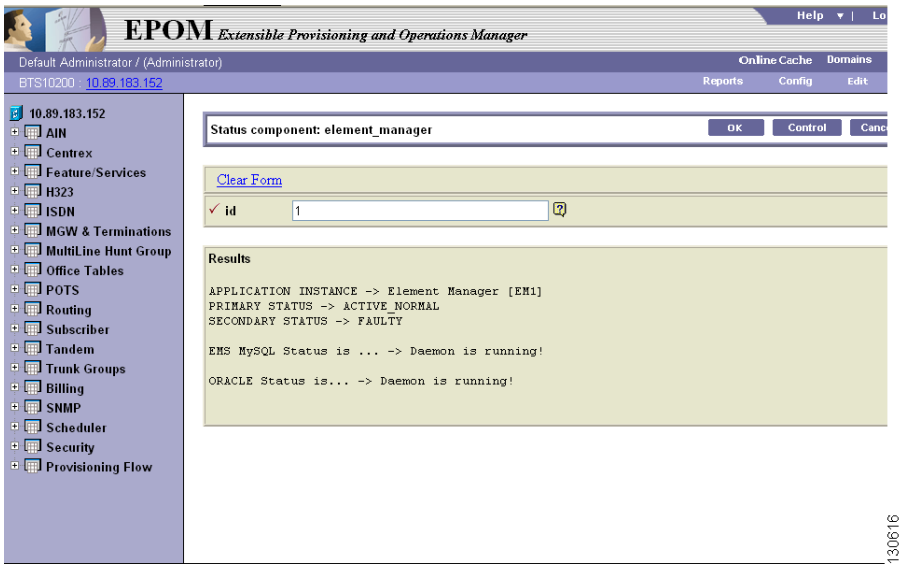
Step 2 Click the EMS server to configure.

The Details window opens.



Step 3 Click **Config**.

The navigation pane shows the Configuration tree, and the content area shows the status of the selected EMS server.



Step 4 Click the noun to view the information on that EMS table and give a verb command for that noun (add, audit, sync, change etc.).

Managing BTS Components

Adding BTS Components Using Domain Tree

Using EPOM you can add components.The BTS has the following independent logical components:

- Call Agent (CA)—Serves as a call management system and media gateway controller. It handles the establishment, processing, and teardown of telephony calls.
- Feature Servers (FSs)—Provide POTS, Tandem, Centrex, and Advanced Intelligent Network (AIN) services to the calls controlled by the CAs. The FSs also provide processing for service features such as call forwarding, call waiting, and LNP.
- Element Management System (EMS)—Controls the entire BTS and acts as a mediation device between an NMS and one or more CAs. It is also the interface for the provisioning, administration, and reporting features of the BTS.

Step 1 From the left pane, select a device.

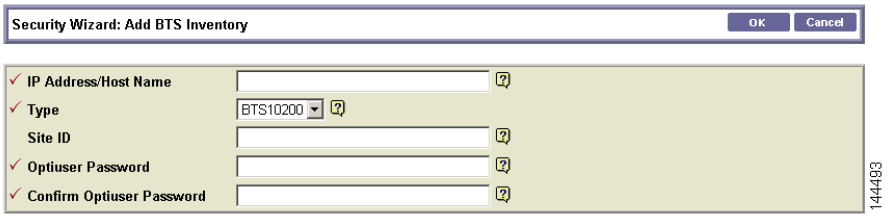
A window appears.

Step 2 Select a device

Adding BTS Inventory

BTS inventory is the BTS EMS server.

Step 1 Click **Add**.



Step 2 Define the:

- **IP Address/Hostname**—IP Address or hostname
- **Type**—host type
- **Site ID**
- **Optiuser Password**
- **Confirm Optiuser Password**

Step 3 Click **OK**.

Adding BTS Components

Add components to the EPOM inventory to build a managed network. The device information includes static and dynamic selections to other parts of the configuration. Follow this example to add a dial plan.

Step 1 From the Domain window, select the *domain* > **BTS10200s** > the *EMS server*.

Step 2 Click **Config**.

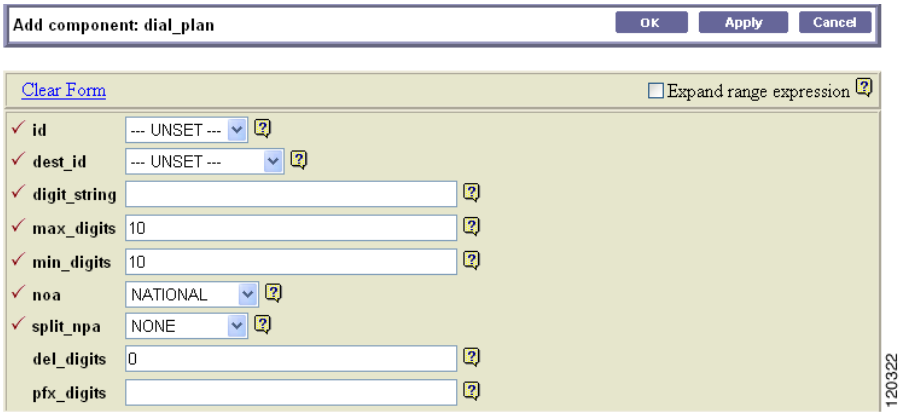
The BTS Component Status window opens.

Step 3 In the Configuration tree, select **Office Tables > dial_plan**.

The BTS Component window opens showing a list of Dial Plans. If this is the first Dial Plan (or device of this type) that you are adding, the list is empty.

Step 4 Click **Add**.

The BTS Component Add window opens.



Step 5 Define the device. Required fields are identified with a red checkmark.

Step 6 Click **OK** or **Apply**.

- When you click **OK**, the component is added and the list of components in the Component:*name* window appears.
- When you click **Apply**, the component is added, but you remain in the Add component window for further tasks.

Checking Status and Controlling Components

Step 1 From the Domain window, navigate to EMS server.

Step 2 Click **Config**.

The BTS Component Status window opens. The Configuration tree appears in the left navigation pane.

Step 3 Navigate to device and click to select it.

Step 4 In the Status window, click **Control**.

Step 5 From the Component Control window, verify that you have selected the correct component, then select a **target_state**.

Step 6 Select state.

Options depend on the type of component that you selected.

Step 7 Click **OK**.

Adding Multiple Components

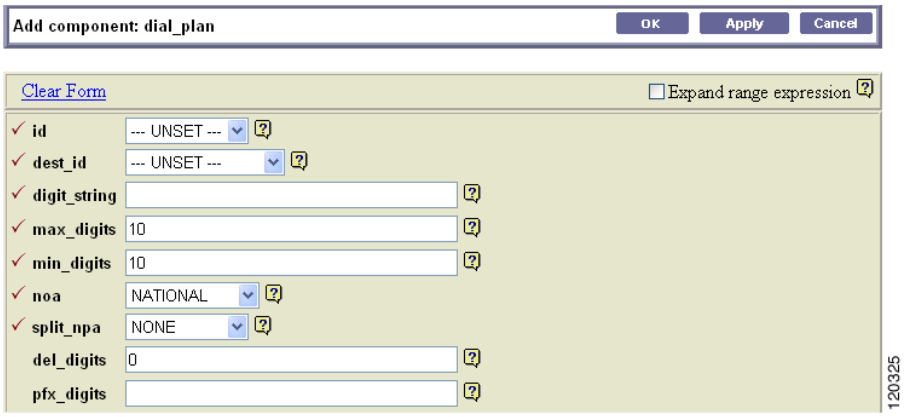
You can only perform bulk provisioning commands on the same type of devices. For instance, if a group of subscribers use the same media gateway and subscriber profile, you can add or edit these subscribers by using a single command.

Step 1 In the EMS-Server window left pane, click a component.

The Component:*name* window appears.

Step 2 Click **Add**.

The Add component window appears.



Step 3 Select the **Expand range expression** check box.

Step 4 In the ID field, enter a range expression in square brackets [ ].

For example, to add a group of 10 dial plans with the id prefix dp001_new, enter dp001_new[01-10]. Doing so adds dial plans dp001_new01, dp001_new02, through dp001_new10.

Step 5 Enter information in the remaining attribute fields.

Step 6 Click **OK** or **Apply**.

- When you click **OK**, the component is added and the list of components in the Component:*name* window appears.
- When you click **Apply**, the component is added, but you remain in the Add component window for further operations.

Editing Multiple Components

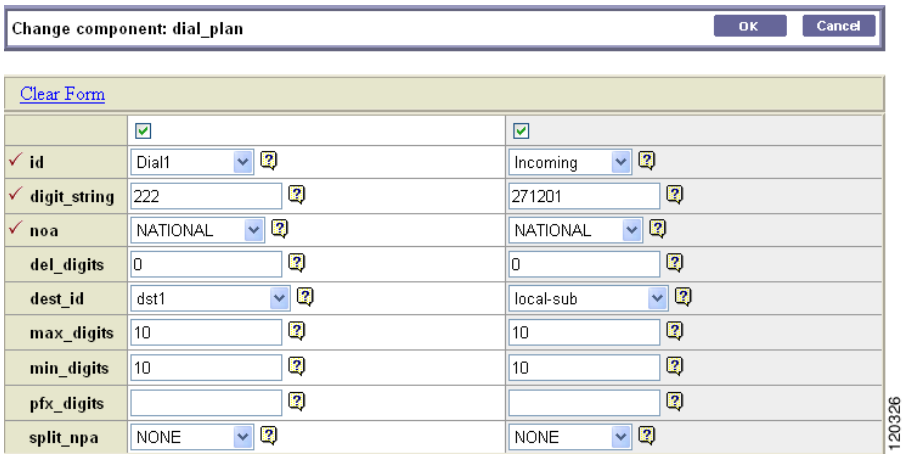
Step 1 In the ems-server window left pane, click a component.

The Component:*name* window appears.

Step 2 In the Component:*name* window, select one or more components that you want to edit.

Step 3 Click **Edit**.

The Change component window appears.



Note The first (blank) row with the checked box indicates that the component in the window title was selected for displaying details, editing, or deletion.

Step 4 Make changes.

Step 5 Click **OK**.

Deleting Multiple Components

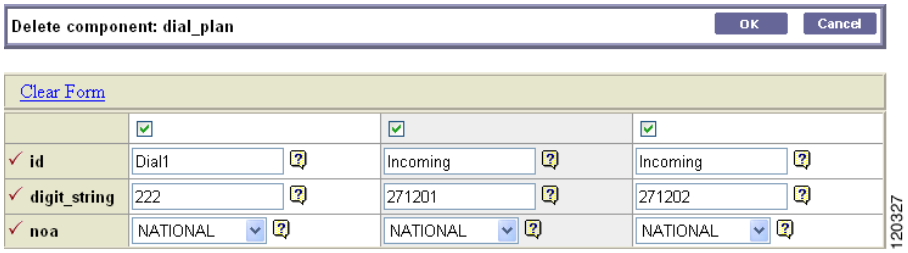
Step 1 In the ems-server window left pane, click a component.

The Component:*name* window appears.

Step 2 In the Component:*name* window, select one or more components to delete.

Step 3 Click **Delete**.

The Delete component window appears with the requested deletions.



Note The first (blank) row with the checked box indicates that this component was selected for displaying details, editing, or deletion.

Step 4 Click **OK**.

CHAPTER 5

Using Provisioning Flows and Templates

Using Provisioning Flows

Provisioning Flows guide you through multistep tasks. Information is carried over from one step to the next. EPOM provides wizards for these common provisioning tasks:

- Provisioning announcements
- Provisioning call agents
- Adding subscribers
- Deleting subscribers
- Deleting residential media gateways
- Diagnosing media gateways
- Provisioning Centrex groups
- Provisioning Centrex subscribers
- Provisioning multiline hunt groups
- Provisioning multiline hunt group subscribers
- Provisioning SS7 trunk groups
- Provisioning H323 trunk groups
- Provisioning basic SS7 routing
- Provisioning advanced SS7 routing
- Provisioning ISDN trunk groups
- Provisioning softswitch trunk groups
- Provisioning 911 (CAS) trunk groups

Step 1 From a Domain window, click domain.

Step 2 Click **BTS10200s.**

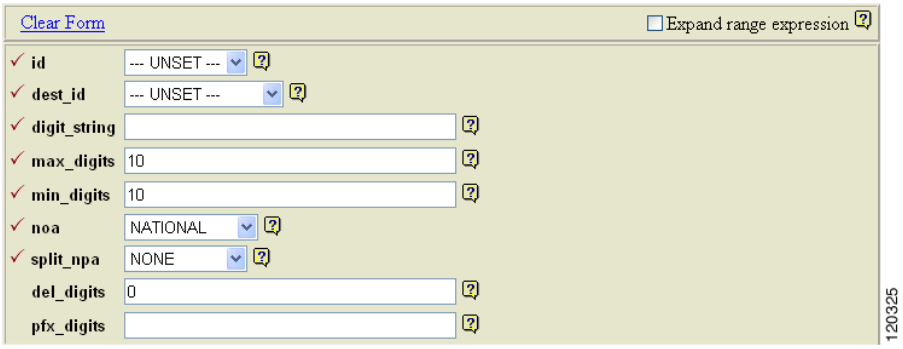
Step 3 Click EMS server.

Step 4 Click **Config**.

The BTS 10200 Component Status window opens.

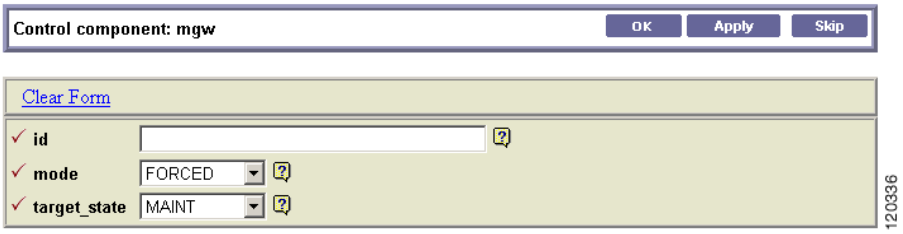
Step 5 In the Configuration tree, click **Provisioning Flows**; then, click the appropriate provisioning wizard.

The BTS Configuration Wizard opens showing the list of provisioning tasks for this flow.



Step 6 Click the first task.

The form for the selected task opens.



Step 7 Fill in the form; then, click **OK**.

Alternatively, if this task is not required or you are not ready to complete it now, click **Skip**. The form for the next task opens.

Step 8 Repeat step 5 for the remaining tasks.

Customizing Provisioning Flows

EPOM allows you to define new provisioning flows (consisting of the tasks necessary to achieve them) and to add them. The following example shows the process of creating a new provisioning flow called MTA Diag.

Note EPOM sees the media termination adapter (MTA) as a media gateway (MGW).

The tasks achieved by this provisioning flow are:

- Placing the MGW into a maintenance state
- Diagnosing the MGW
- Restoring the MGW to service

Note In this example, the filename that is used is mgw_diagnose.xml. It is located in this directory: /opt/CSCOepom/tomcat/webapps/ROOT/xml/bts/wizard/.

```
<Provisioning_wizard>
```

```
<step_name="Control MGW MAINT"
    url="btscompcontrol.jsp?_noun=mgw"
    help_mssg="Control the mgw into MAINT state"
    img="bluedot.gif">
    <provideParameterList>
    <parameter name="mgwId" sourceName="id"/>
    </provideParameterList>
    <takeParameterList>
    <parameter name="mode" sourceName="FIXED" value="FORCED"/>
    <parameter name="target_state" sourceName="FIXED" value="MAINT"/>
    </takeParameterList>
</step>

<step_name="Diagnose MGW"
    url="btscompdiag.jsp?_noun=mgw"
    help_mssg="When done with diagnosis, click the skip button, I really should not
    carry you away from this page"
    img="bluedot.gif">
    <provideParameterList>
    <parameter name="mgwId" sourceName="id"/>
    </provideParameterList>
    <takeParameterList>
    <parameter name="id" sourceName="mgwId/">
    <parameter name="test" sourceName="FIXED" value="3"/>
    </takeParameterList>
</step>

<step_name="Control MGW INS"
    url="btscompcontrol.jsp?_noun=mgw"
    help_mssg="Control the mgw into INS state"
    img="bluedot.gif">
    <provideParameterList>
    <parameter name="mgwId" sourceName="id"/>
    </provideParameterList>
    <takeParameterList>
    <parameter name="mode" sourceName="mgwId/">
    <parameter name="mode" sourceName="FIXED" value="INS"/>
    <parameter name="mgwId" sourceName="id"/>
    </takeParameterList>
</step>
```

Where,

- *step_name*—The name of the task displayed in the right pane when you click on the MTA Diag provisioning flow item in the left pane.
- *url*—The jsp page name from the URL, followed by the component name.
- *help_mssg*—Reserved for future use.
- *img*—The example uses the default icon, but you can define your own icon for each step.
- *provideParameterList*—Items within this tag record user input for this step after the page appears and the user clicks **Ok**. You can use the parameters that are used here in subsequent steps.
  - *name*—The parameter name used by the page.
  - *sourceName*—When this is FIXED, the value that follows is used. Otherwise, you can use parameter names that are defined under the provideParameterList tag in previous steps.
- *takeParameterList*—Items within this tag accept parameters passed from previous steps.
  - *name*—The parameter name used by the page.

– *sourceName*—When this is FIXED, the value that follows is used. Otherwise, you can use parameter names that are defined under the provideParameterList tag in previous steps.

Creating Provisioning Flows

In this task, the filename used is **mgw_diagnose**.

Step 1 Create the mgw_diagnose.xml file.

Step 2 Place the *mgw_diagnose.xml* file in /opt/CSCOepom/tomcat/webapps/ROOT/xml/bts/wizard.

Step 3 Make a backup copy of the defaulttree.xml file located at /opt/CSCOepom/tomcat/webapps/ROOT/xml/bts/navigation/defaulttree.xml.

Step 4 Modify the defaulttree.xml by adding these commands to the file:

```
<node name="MTA Diagnose">
<url base="btswizard">mgw_diagnose</url>
</node>
```

Note The location of this code in the .xml file defines the structure of the navigation tree. Make sure that you add it to the correct "branch."

Step 5 Stop and start EPOM..

Step 6 Verify that MTA Diag is added to the Provisioning Flow list by choosing **Domain > all > BTS10200 > Summary > Provisioning Flow**.

Using Templates

Use EPOM templates to createand save templates for creating BTS objects.

Templates are stored on the EPOM server by BTS noun and template name.

Templates can be created, viewed, and applied by all levels of EPOM users. Administrators can edit and delete all existing templates, whereas Users can edit and delete only the templates that they created.

Creating EPOM Templates

Step 1 In a Domain view, select **domain > BTS10200s > EMS server**

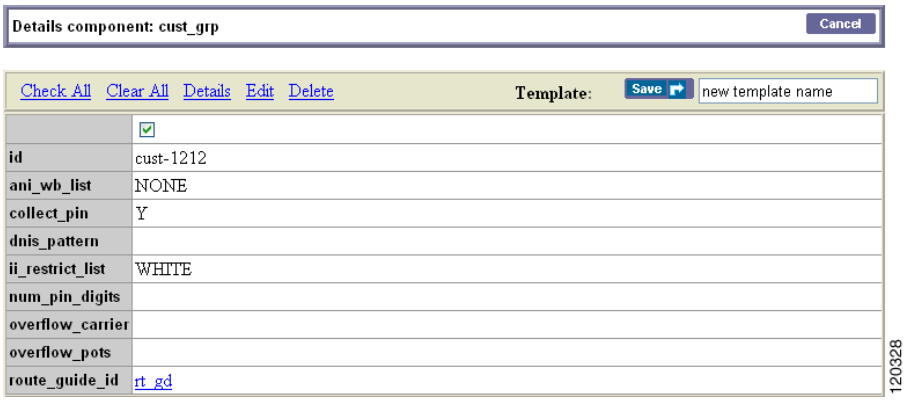
Step 2 Click on **Config**.

The BTS Component Status view opens.

Step 3 In the Configuration tree, select **Office Tables > Call_agent**.

The BTS Component view opens showing a list of call agents.

Step 4 Select a call agent and click **Details**.



Step 5 Enter information in the fields. ID is unique to each device. You can either specify a value to be used as a prefix, or leave a blank field that forces the user to specify a valid, unique ID.

Step 6 Enter a name for the template and click on **Save**.

The created template contains field information from the Details Component window.

Using Existing Templates to Create New Templates

Step 1 In a Domain view, select **domain > BTS10200s > EMS server**.

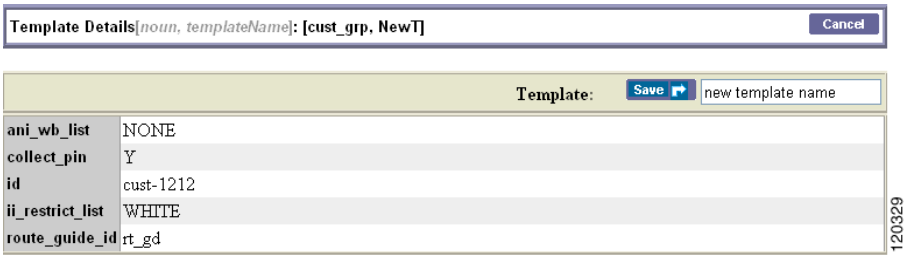
Step 2 Click **Config**.

The BTS Component Status view opens.

Step 3 In the Configuration tree, select **Template Manager > Templates**.

A list of templates appears.

Step 4 Select a template and click **Details**.



Step 5 Enter information in the fields. ID is unique to each device. You can either specify a value to be used as a prefix, or leave a blank field that forces the user to specify a valid, unique ID.

Step 6 Enter a new template name.

Step 7 Click **Save**.

The new template is stored under the specified name.

Editing EPOM Templates

Step 1 In a Domain view, select **domain > BTS10200s > EMS server**.

Step 2 Click **Config**.

The BTS Component Status view opens.

Step 3 In the Configuration tree, select **Template Manager > Templates**.

A list of templates appears.

Step 4 Select a noun and template and click **Edit**.

The Edit Template window appears.

If necessary, make changes to the information in the fields and click **OK** to save changes.

Setting Default EPOM Templates

One template for each device type can be identified as the default template. When you add a device, the default template automatically loads. If necessary, you can select a different template for this device.

Step 1 In a Domain view, select **domain > BTS10200s > EMS server**.

Step 2 Click **Config**.

The BTS Component Status view opens.

Step 3 In the Configuration tree, select **Template Manager > Templates**.

A list of templates appears.

Step 4 Select a noun and template and click **Edit**.

The Edit Template window appears

Step 5 Select the Default template checkbox.

Step 6 Click **OK** to save changes.

Deleting EPOM Templates

When you delete an EPOM template you also delete all the data it contains.

Step 1 In a Domain view, select **domain > BTS10200s > EMS server**.

Step 2 Click **Config**.

The BTS Component Status view opens.

Step 3 In the Configuration tree, select **Template Manager > Templates**.

A list of templates appears.

Step 4 Select a noun and template and click **Delete**.

Applying EPOM Templates

Templates are applied only when creating an object (during an Add operation).

Step 1 In a Domain view, select **domain > BTS10200s > EMS server**.

Step 2 Click **Config**.

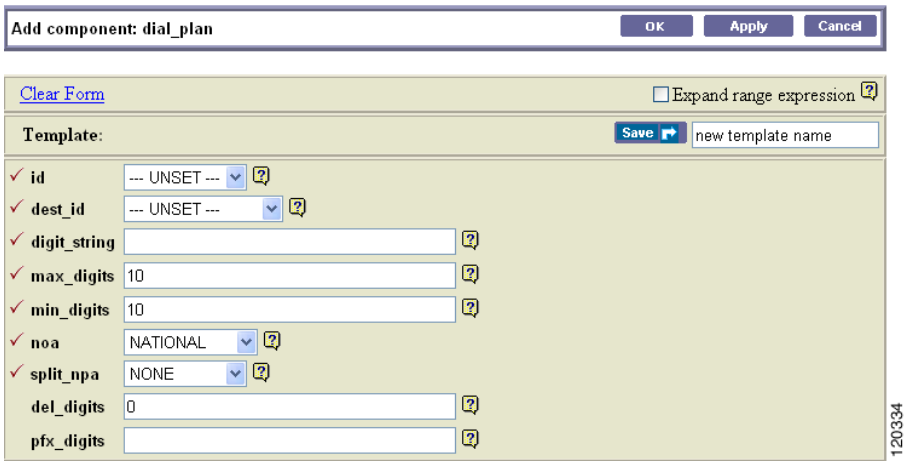
The BTS Component Status view opens

Step 3 In the Configuration tree, select **Office Tables > dial_plan**.

The BTS Component view opens showing a list of dial plans.If this is the first dial plan (or device of this type) that you are adding, the list is empty

Step 4 Click **Add**.

The BTS Component Add view opens.



Step 5 Select a template from the list.

Step 6 Click **Load.**

Click **OK** or **Apply**.

- When you click **OK**, the component is added and the list of components in the Component name window appears.
- When you click **Apply**, the component is added, but you remain in the Add component window for further operations

CHAPTER 6

Maintaining and Troubleshooting EPOM

Viewing Reports

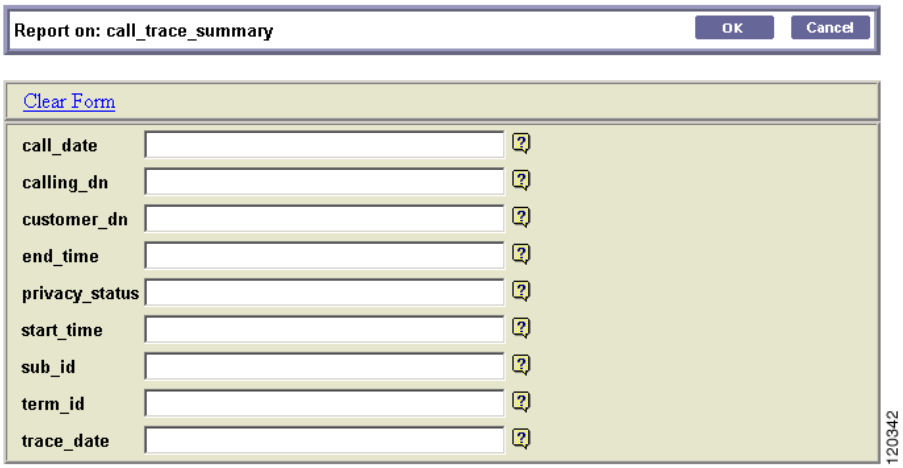
Step 1 Navigate to EMS server from a Domain window.

Step 2 Click **Reports**.

The BTS Component Reports window opens.

Step 3 In the Reports tree, under Performance or Billing, select the type of report.

A report query form opens.



Step 4 Specify the criteria for.

Step 5 Click **OK**.

Step 6 To view the reports see Viewing BTS EMS Reports.

Viewing BTS EMS Reports

View reports like Audit Report, System Health, and BTS Import Errors by clicking the BTS device from the Top Menu bar.

Access BTS EMS reporting parameters that include performance and billing reports (call detail records created on the system through the billing_record function).

Step 1 Click the BTS device in the Domains Tree and then click the device from the Top pane. A login dialog box appears.

Step 2 Enter the BTS login and password. A window with options to view the reports and help file appears.

Step 3 Select **View a BTS10200 report** link. A window with the list of indexes and reports appears.

Step 4 Click the required report or index link, the respective report or index gets displayed.

Managing CORBA

Changing CORBA and SSL Values

The EPOM server arrives with SSLvalues set. Only do the following if you change the default directory from **/opt/CSCOepom** .

Step 1 Log into the EPOM web server.

Step 2 Change user to superuser:

```
su - root
```

Step 3 Go to the main properties file:

```
cd /opt/CSCOepom/tomcat/webapps/ROOT/WEB-INF/classes/com/cisco/opus/
props
```

Step 4 Change **corba.orb.configfile**:

```
corba.orb.configfile=/opt/new_directory_name/tomcat/ssliiop/OpenORB.xml
```

Step 5 List SSL files:

```
cd /opt/myEPOM/tomcat/ssliiop

The following files appear:
ls
bts10200.cer  bts10200_ts  OpenORB.xml  pss.xml
bts10200_ks   default.xml  ots.xml      SSLIOP.xml
```

Step 6 Change **SSLIOP.xml**:

```
<property name="context.keyStore.URL" value =
"/opt/new_directory_name/tomcat/ssliiop/bts10200_ks" />

<property name="context.trustStore.URL" value =
"/opt/new_directory_name/tomcat/ssliiop/bts10200_ts" />
```

Managing CORBA Cache

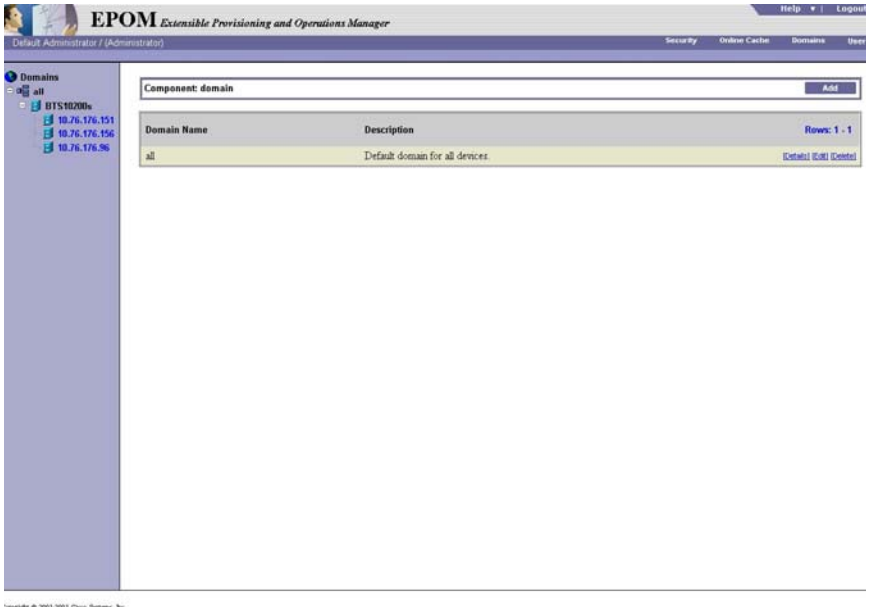
The CORBA Cache reduces BTS query time and enhances EPOM performance.Using the Online Cache window an administrator can do the following with EPOM's internal CORBA cache:

- view
- delete—when a BTS server is deleted from the inventory list of the EPOM server
- renew
  - when a BTS server restarts
  - when someone invokes **`pkill cis`** on a BTS server
  - when EPOM cannot find BTS CORBA objects

If the EPOM cannot query the BTS server, the administrator can delete or renew the CORBA Cache. This allows EPOM servers to query restarted BTS servers without being restarted themselves.

Step 1 From EPOM window, click **Online Cache**.

The Online Cache Management window opens.



Step 2 Cache information for all the configured BTS inventories can be viewed.

Pool name	Key Names
10.76.62.126----opti	IDENTIFIER_ANONYMOUS_UNSUSED:4
	IDENTIFIER_ANONYMOUS_UNSUSED:3
	IDENTIFIER_ANONYMOUS_UNSUSED:2
	IDENTIFIER_ANONYMOUS_UNSUSED:1
	IDENTIFIER_ANONYMOUS_UNSUSED:10
	IDENTIFIER_ANONYMOUS_UNSUSED:9
	IDENTIFIER_ANONYMOUS_UNSUSED:8
	IDENTIFIER_ANONYMOUS_UNSUSED:7
	IDENTIFIER_ANONYMOUS_UNSUSED:6
	IDENTIFIER_ANONYMOUS_UNSUSED:5
172.28.169.55----opt	IDENTIFIER_ANONYMOUS_UNSUSED:4
	IDENTIFIER_ANONYMOUS_UNSUSED:3
	IDENTIFIER_ANONYMOUS_UNSUSED:2
	IDENTIFIER_ANONYMOUS_UNSUSED:1
	IDENTIFIER_ANONYMOUS_UNSUSED:10
	IDENTIFIER_ANONYMOUS_UNSUSED:9
	IDENTIFIER_ANONYMOUS_UNSUSED:8
	IDENTIFIER_ANONYMOUS_UNSUSED:7

Step 3 Click **Renew** or **Delete** for BTS inventory to renew or delete its CORBA Cache.

Pool name	Login	Site id	Maxsize	Size	
10.76.62.126	optiuser		50	10	[Renew] [Delete]
172.28.169.55	optiuser		50	10	[Renew] [Delete]
172.28.169.54	optiuser		50	10	[Renew] [Delete]
10.76.62.79	optiuser	rtp2vtc	50	10	[Renew] [Delete]
ems-server3	optiuser		50	10	[Renew] [Delete]

130613

Step 4 Click any BTS inventory on the left pane and the proceed with normal operations for the relevant inventory.

Managing EPOM

Upgrading EPOM

Backing up BTS Servers

Use the bts_export command to backup information on a BTS server. This is especially important to do before an upgrade.

bts_export looks like the following:

```
root@cyber229:opt 21> /opt/CSCOepom/bin/bts_export

NAME

   bts_export - BTS Config Export

SYNOPSIS

   bts_export -h hostname -v BTSver of hostname -o outfile [-l login -p password

]

DESCRIPTION

   Export a BTS Configuration.

OPTIONS

   -h   Hostname

   -v   BTSversion of hostname (3.5,4.1,4.2,4.4.0,4.4.1. 4.5.0)

   -o   Output file

   -l   Login

   -p   Password

   -s   Site ID

EXAMPLES

   1. bts_export -h bts_host -v host_bts_ver -o config.cli

   2. bts_export -h bts_host -v host_bts_ver -l login -p passwd -s       siteid -o con

      fig.cli
```

Step 1 Change user to superuser:

```
su - root
```

Step 2 Create a temporary directory (epom_install2) for new EPOM image:

```
cp epom-5_0_20041216-1.tar /opt/epom_install2
cd /opt/epom_install2
```

Step 3 Extract image from tarfile:

```
tar -xvf epom-5_0_20041216-1.tar
```

Step 4 List contents:

```
ls
epom-5_0_20041216-1 epom-5_0_20041216-1.tar
```

Step 5 Move new, untarred image:

```
cd epom-5_0_20041216-1
```

Step 6 Install new image:

```
./setup
```

This message appears:

```
Warning:
The Extensible Provisioning and Operations Manager x.x is currently installed and must be
uninstalled before this version is installed.
```

Step 7 Confirm uninstall current version.
A message appears:

```
Note: The CSCOepom data directory, /var/opt/CSCOepom still exists and must be removed
manually.

Using previously installed MySQL database.

Using previously installed EPOM database.
Verifying EPOM Database.
Starting mysqld daemon with databases from /var//opt/CSCOepom/data/db
MySQL Server has started
Verifying EPOM Database Tables

Extensible Provisioning and Operations Manager installation is complete.
```

Step 8 To clear the databases following a EPOM upgrade. Reinitialize the MySQL and EPOM databases by entering:

```
/opt/CSCOepom/mysql/install/bin/installMySQLDB -ifs
/opt/CSCOepom/mysql/install/bin/installEPOMDB -ifs
```

Stopping EPOM

Stopping the EPOM means stopping the tomcat server and mysql. After doing this, the browser will not show the EPOM login screen.

From the EPOM web server, type:

/opt/CSCOepom/bin/epom stop

The following message appears:

```
% /opt/CSCOepom/bin/epom stop
-----------------------------------------------
Stopping EPOM
-----------------------------------------------
Stopping MySQL
041216 15:26:12 mysqld ended (This appears only in the window from which EPOM was started)
MySQL server has stopped
Stopping Tomcat
Tomcat has stopped
-----------------------------------------------
EPOM Stopped
-----------------------------------------------
```

Uninstalling EPOM

You may need to uninstall EPOM in cases of :

- installation failure
- partial installation
- port set up assignment

Uninstalling EPOM ensures it will not conflict with other management tools like LAN Management Suite (LMS) or Call Manager.

Step 1 Change user to superuser:

su - root

Step 2 Ensure you are not in **/opt/CSCOepom** .

Step 3 Run uninstallation script:

/opt/CSCOepom/uninstall/uninstall

Step 4 Manually delete data files from **/var/opt/CSCOepom**.

Archiving EPOM Log Files

EPOM automatically generates various log files. These logs are created in the logs directory in the "/var/opt/CSCepom/logs/" path :

- User and Domain related information is generated in "audit.log"
- Stand alone tomcat information is generated in "Catalina.out"
- User HTTP request information is generated in "localhost_access_log" , this is generated date wise.
- Detail log is generated in the server "localhost_log" , this is generated date wise.
- Detail log of all debugging information is generated in "trace.log"

User access log details organized by date. Similarly "trace.log" appends information to the existing log. EPOM does not automatically clean this log information.

Step 1 Archive all logs:

/usr/bin/tar –cvf epom_logs.tar /var/opt/CSCOepom/logs/

Step 2 FTP or TFPT to another machine.

Troubleshooting

Problem 1

Recreating the EPOM database if needed (for example, if you forget the admin password and cannot access the database)

Troubleshooting Action 1

Reinitialize the EPOM databases:

```
/opt/CSCOepom/mysql/install/bin/install/
MySQLDB -ifs
/opt/CSCOepom/mysql/install/bin/install/EPOMDB -ifs
```

Problem 2

Problems in EPOM communicating to the EMS server, such as the one in the message below

Could not retrieve object attributes for object name. The most possible reason is failure to log into the EMS server or CORBA agent on EMS server is not working. Please make sure hostname/login/password/siteid is correct. Also check the log file

Troubleshooting Action 2

- Check the information in the EMS server definition to make sure it is correct.
- Check connectivity between EPOM and the Cisco BTS EMS (if they are not co-resident): Log in to the EPOM server and ping the EMS server.
- Verify that the correct CORBA adapter has been installed on the EMS server.
- Check the log files.
- View log files: Log files are stored in:

  /var/$EPOM_INST_DIR/logs,
  where $*EPOM_INST_DIR* is the EPOM installation directory.

  By default log directory is **/var/opt/CSCOepom/logs**

  Most important log file is trace.log, current activity can be seen by logging onto EPOM server and running the command:

  ```
  tail -f /var/$EPOM_INST_DIR/logs/trace.log
  ```

- View BTS CIS log file, /opt/ems/log/CIS.log. Current activity can be seen by logging onto Cisco BTS server and running command:

  ```
  tail -f /opt/ems/log/CIS.log
  ```

- Use log files for debugging EPOM problems or for supplying information to Cisco TAC.

- Check whether BTScis package is installed on EMS server. Log onto EMS server and running command:

  pkginfo BTScis

- Check whether cis and ins services are running on EMS server. Log onto EMS server and invoke commands:

  ps -ef | grep cis

  ps-ef |grep ins

- Check whether ports 683 and 14001 are in LISTEN state on the EMS server. Log onto EMS server and invoke commands:

  netstat -an |grep 683

  netstat -an |grep 14001

- Check whether ports 683 and 14001 on EPOM server are in ESTABLISHED state with the EMS server. Log onto EPOM server and invoke commands:

  netstat -an |grep 683

  netstat -an |grep 14001

- Check connectivity between EPOM server and EMS server. Log onto EPOM server and ping EMS server from EPOM server.

  Check whether EPOM server can send packets to EMS server at ports 683 and 14001. Log onto EMS server and invoke commands:

  telnet bts_server 683

  telnet bts_server 14001

- Check whether EPOM server can resolve the hostname of the EMS server. As a workaround insert hostname entries into the /etc/hosts file of EPOM server.
- Log onto both EPOM server and EMS server and use snoop command to verify that sizeable amount of data is exchanged between the 2 servers on port 683 and 14001.
- Verify that the hostname of the EMS server is same as the name used by the EMS server for its ins service. Log onto EMS server and invoke following command:

  ps -ef | grep ins

  Output would also contain the hostname to which ins service is bound.

- Use IP address of the EMS server, while adding to EPOM server.
- Use IP address of the EMS server to initialize ins and cis services on the EMS server. This makes it for EPOM CORBA client to locate the EMS server CORBA server naming context.
- If you notice exception of sort vmcid 0X200 or another hexadecimal digit, then In this case **renew** the EPOM CORBA Cache for the relevant BTS server.
- If this happens too often for a EMS server that was accessible some time before, it means that the particular EMS server has been restarted or the CIS services have been restarted. In this case **renew** the EPOM CORBA Cache for the relevant BTS server.

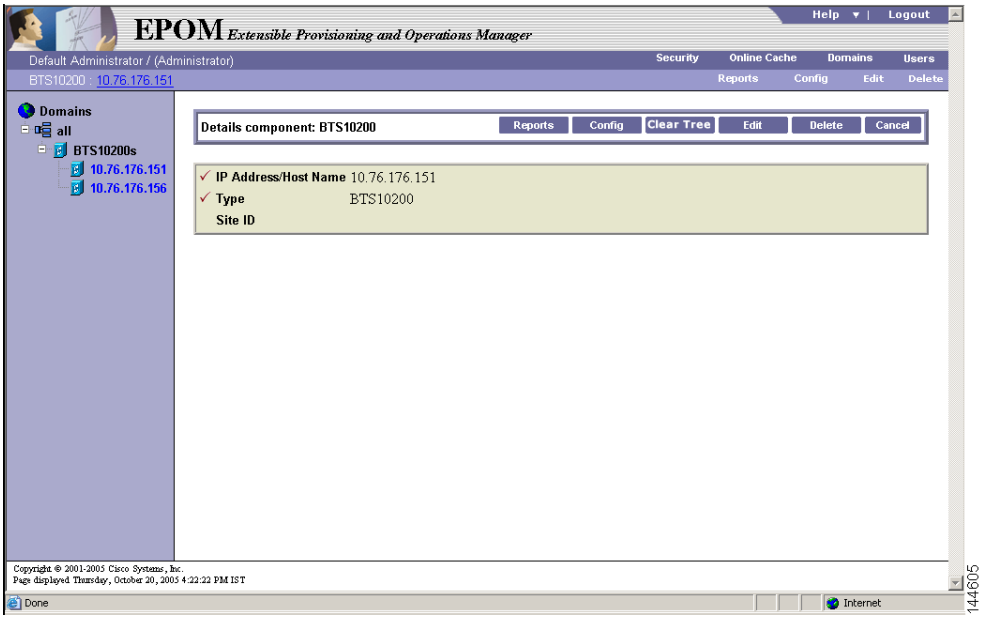
Problem 3

EPOM BTS Command Navigation Tree, problems. Tree appears without commands or JavaScript is rendered on the page.

Troubleshooting Action 3

EPOM has introduced a new **Clear Tree** button, click on this button to re-build EPOM BTS Command Navigation Tree. This tree is otherwise cached and without clicking the Clear Tree buttons, invalid tree appears.

In case you still face the issue, then delete all the cache from your web-browser. For Internet Explorer, click **Tools > Internet Options > General > Temporary Internet Files > Delete Files**. Or use a separate machine to do the same.



Problem 4

EPOM logs not being renewed.

Troubleshooting Action 4

- Check disk usage of /var directory on EPOM server. Log onto EPOM server and invoke command:

  ```
  df -k |grep var
  ```

- The logs with older date stamps can be safely archived in some other directory.
- The logs can be moved to another directory that has more disk space than /var directory e.g /opt , but that needs restart of EPOM server. As an example if /opt/CSCOepom is the install directory, then the logs can be moved from their current default location /var/opt/CSCOepom/logs to /opt/CSCOepom/logs. Log onto EPOM Server and invoke following commands:

  ```
  cd  /var/opt/CSCOepom

  mv   logs /opt/CSCOepom/logs

  ln -s /opt/CSCOepom/logs logs

  /opt/CSCOepom/bin/epom stop

  /opt/CSCOepom/bin/epom start
  ```

Problem 5

EPOM takes time to build its CORBA Cache.

Troubleshooting Action 5

This is default behavior of EPOM, generally EPOM should be used at least 10 minutes after it has been started. The time taken by EPOM depends on the number of EMS servers added to EPOM server.

If one of the EMS server faces CORBA communication problem, then it would have a tail effect on the EMS servers following it. Once the EPOM CORBA Cache is built, it takes very less time to communicate through CORBA with the EMS servers.

Problem 6

EPOM JVM tunings

Troubleshooting Action 6

The best Sun JVM settings have been observed as:

```
-server -XX:+UseParallelGC -Xms512M -Xmx512M
```

These settings have major impact on performance of EPOM and Cisco doesn't suggest changing these parameters.

If really essential, the tunings can be changed by modifying EPOM_OPTS variable in the file /opt/CSCOepom/tomcat/bin/epomcatalina.sh

If it is felt that the current Sun JVM settings are not fine for your installation, then enable the:

```
-verbosegc
```

option in EPOM_OPTS, as defined above and contact Cisco TAC with your installation details and logfile:

/var/opt/CSCOepom/logs/Catalina.out

Problem 7

For a Change (Edit) operation, if a particular parameter has some value and the user wants that value to be null. The simply deleting the value from EPOM GUI during a change (Edit) operation would not nullify it.

Troubleshooting Action 7

Enter **NULL** for the relevant parameter in EPOM GUI.

Problem 8

EPOM bts_export errors

Troubleshooting Action 8

Many errors arise while usage of bts_export, due to two main reasons:

- CORBA Communication is not established properly; try using IP address rather than hostname.
- root or other such Cisco BTS EMS logins are used, which are not associated with a BTS shell. Try using Cisco BTS EMS logins that are associated with BTS CLI shell, like optiuser.

Problem 9

CORBA Error: Exceeded maximum number of users.

Troubleshooting Action 9

- You must terminate the CIS process in BTS by logging into the EMS server and invoke the following commands:

ps -ef |grep cis

kill -9 <cis process id

Problem 10

After changing BTS CIS from non-secure to secure or secure to non-secure EPOM is unable to communicate with BTS 10200 EMS.

Troubleshooting Action 10

For changing from secure to non-secure and vice-versa, you must renew or delete the cache for that inventory.